AN ADVISORY SERVICES PANEL REPORT

Kennedy Space Center, Florida

Urban Land Institute

Kennedy Space Center, Florida

A Strategy for the International Space Research Park

July 8–13, 2001
An Advisory Services Panel Report

ULI–the Urban Land Institute
1025 Thomas Jefferson Street, N.W.
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About ULI–the Urban Land Institute

ULI–the Urban Land Institute is a nonprofit research and education organization that promotes responsible leadership in the use of land in order to enhance the total environment.

The Institute maintains a membership representing a broad spectrum of interests and sponsors a wide variety of educational programs and forums to encourage an open exchange of ideas and sharing of experience. ULI initiates research that anticipates emerging land use trends and issues and proposes creative solutions based on that research; provides advisory services; and publishes a wide variety of materials to disseminate information on land use and development.

Established in 1936, the Institute today has more than 16,000 members and associates from 60 countries, representing the entire spectrum of the land use and development disciplines. Professionals represented include developers, builders, property owners, investors, architects, public officials, planners, real estate brokers, appraisers, attorneys, engineers, financiers, academicians, students, and librarians. ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice. The Institute has long been recognized as one of America's most respected and widely quoted sources of objective information on urban planning, growth, and development.

This Advisory Services panel report is intended to further the objectives of the Institute and to make authoritative information generally available to those seeking knowledge in the field of urban land use.

Richard M. Rosan
President

Cover photo: NASA. Space shuttle *Atlantis* arcs into the early-morning sky over the Atlantic Ocean. *Atlantis* lifted off from Launch Pad 39B on schedule at 5:03:59 a.m., EDT, on July 12, 2001. With a crew of five, it was heading out on the tenth assembly flight to the International Space Station.

Inside cover photo: NASA. A space radar image of the Kennedy Space Center, spanning an area of about 20 kilometers by 40 kilometers (12 miles by 25 miles), shows the shuttle landing strip at the top left. The shuttle launch pads are the two white areas near the top center of the image. Just above the image center is a cluster of white spots, which are the major buildings of the Kennedy Space Center industrial area.

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About ULI Advisory Services

The goal of ULI's Advisory Services Program is to bring the finest expertise in the real estate field to bear on complex land use planning and development projects, programs, and policies. Since 1947, this program has assembled well over 400 ULI-member teams to help sponsors find creative, practical solutions for issues such as downtown redevelopment, land management strategies, evaluation of development potential, growth management, community revitalization, brownfields redevelopment, military base reuse, provision of low-cost and affordable housing, and asset management strategies, among other matters. A wide variety of public, private, and nonprofit organizations have contracted for ULI's Advisory Services.

Each panel team is composed of highly qualified professionals who volunteer their time to ULI. They are chosen for their knowledge of the panel topic and screened to ensure their objectivity. ULI panel teams are interdisciplinary and typically include several developers, a landscape architect, a planner, a market analyst, a finance expert, and others with the niche expertise needed to address a given project. ULI teams provide a holistic look at development problems. Each panel is chaired by a respected ULI member with previous panel experience.

The agenda for a five-day panel assignment is intensive. It includes an in-depth briefing day composed of a tour of the site and meetings with sponsor representatives; a day and a half of hour-long interviews of typically 80 to 100 key community representatives; and a day and a half of formulating recommendations. Many long nights of discussion precede the panel's conclusions. On the final day on site, the panel makes an oral presentation of its findings and conclusions to the sponsor. At the request of the sponsor, a written report is prepared and published.

Because the sponsoring entities are responsible for significant preparation before the panel's visit, including sending extensive briefing materials to each member and arranging for the panel to meet with key local community members and stakeholders in the project under consideration, participants in ULI's five-day panel assignments are able to make accurate assessments of a sponsor's issues and to provide recommendations in a compressed amount of time.

A major strength of the program is ULI's unique ability to draw on the knowledge and expertise of its members, including land developers and owners, public officials, academicians, representatives of financial institutions, and others. In fulfillment of the mission of the Urban Land Institute, this Advisory Services panel report is intended to provide objective advice that will promote the responsible use of land to enhance our environment.

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Special thanks go to Roy Bridges, director of the Kennedy Space Center, for his support and guidance during the panel's work. Jim Ball, International Space Research Park project coordinator, deserves much appreciation for setting the groundwork for the project, and the panel recognizes Jan Heuser, program manager, and Delores Abraham, staff member, at the National Aeronautics and Space Administration (NASA), for their hospitality and considerable efforts in helping the panel to achieve its goals expeditiously. Ron Hight, manager of the Merritt Island National Wildlife Refuge, U.S. Fish and Wildlife Service, helped set the context for future development options, and Stephanie Roy of Futron Corporation provided substantive support before and during the panel's visit.

Thanks are also extended to Ed Gormel and Tim Franta of the Spaceport Florida Authority, and to Dr. Pamella J. Dana, director of the Florida Governor's Office of Tourism, Trade, and Economic Development.

Contents

ULI Panel and Project Staff	6
Foreword: The Panel's Assignment	7
Summary of Findings and Recommendations	9
Market Potential	12
Planning and Design	16
Development Strategies	22
Implementation	27
Conclusion	35
About the Panel	36

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Foreword: The Panel's Assignment

The Urban Land Institute was invited by the John F. Kennedy Space Center (KSC) to provide advice and recommendations related to the potential development of a 400-acre Space Commerce Park at the center.

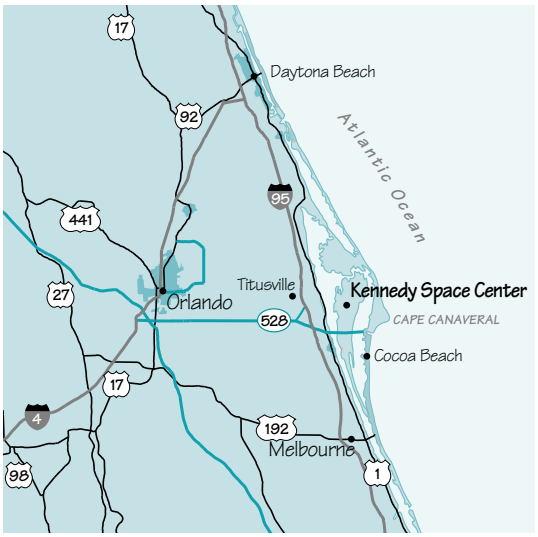
KSC is NASA's launch site for the space shuttle and for many of the elements that make up the International Space Station (ISS), a major orbital research facility currently being built in space through the combined efforts of 16 nations. KSC also manages NASA's expendable, or uncrewed, launch vehicles program, and the center's mission for NASA covers space launch operations, as well as development of spaceport and range technology in support of launch and space vehicles.

KSC, located in northern Brevard County, Florida, about 35 miles east of Orlando, comprises more than 140,000 acres, including 55,000 acres that are submerged or are wetlands. Undeveloped areas not actively used in support of NASA activities are managed by the U.S. Fish and Wildlife Service as the Merritt Island National Wildlife Refuge. Adjacent to KSC is the Cape Canaveral Air Force Station, the East Coast space launch facility for the Department of Defense.

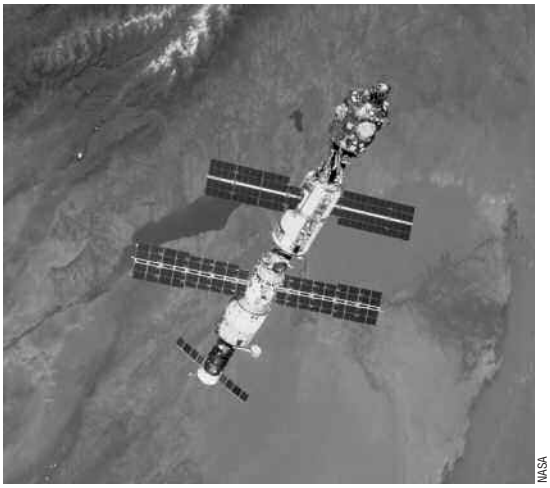
KSC's objectives in creating a research park are to support ISS development and commercial growth and to help promote itself as a world leader in the development of spaceport and range technology, while maintaining the center's prominence in launch operations. As a high-profile first step in this process, construction of the Space Experiment Research and Processing Laboratory (SERPL) has been approved and funded through a collaborative effort between NASA and the state of Florida. This 100,000-square-foot facility, to be adjacent to the proposed Space Commerce Park, will be used for life sciences research and the processing of ISS payloads.

As a partner in the proposed project, Florida has a strong interest in the success of the park. Its objectives are shaped by the desire to strengthen the intellectual capital and academic standing of the region and to bolster its position in the global market for space launches and related products and services. The state body directly involved in the project is the Spaceport Florida Authority (SFA), an organization empowered to pursue the state's interest in the development of the Florida space economy. SFA reports to the Office of Tourism, Trade, and Economic Development in the Florida Governor's Office.

KSC wants to ensure that it conceives, plans, and proceeds with implementation of a research park that will meet its strategic objectives, be sensitive to the environment and



Location map (above). Area detail (left).



NASA

ULI panel members (above) tour the Processing Facility for the International Space Station at the Kennedy Space Center. The International Space Station (above right) is an orbiting laboratory developed and now being constructed in space through the combined resources and scientific expertise of 16 nations.

surrounding land uses, have a positive impact on the state and neighboring communities and their economic development goals, and be successful from both a business and research standpoint.

Within this context, the ULI Advisory Services panel's specific task was to identify development impediments and opportunities related to the project, to assess its market potential, and to provide recommendations for planning, designing, and implementing the project. The panel's effort serves as an integral part of a larger Space Commerce Park development study by Futron Corporation (under contract to NASA) to address the strategic, legal, regulatory, marketing, and business planning aspects of the proposed park.

Over the course of the five-day assignment, the panel became convinced that the opportunity is far more extensive than initially identified to develop a high-tech business park that could raise the stature of KSC as a hub for spaceport technology. In recognition of this, it was recommended that the proposed park be referred to as the International Space Research Park (ISRP), a name that was formally approved by KSC in September 2001.

Summary of Findings and Recommendations

The panel's findings and recommendations are divided into four principal sections: market potential, planning and design, development strategies, and implementation. The highlights are summarized below.

Market Potential

The panel's outlook for the market potential at a new International Space Research Park at Kennedy Space Center is positive. Although the local real estate market currently shows signs of weakness, the panel believes strongly that larger factors should be taken into consideration when assessing the project's potential. These factors include the strong image and stature of KSC, the efforts by NASA and the state of Florida to promote the region as a center for spaceport technology, and the opportunity for the state and KSC to obtain their fair shares of nationwide research and development (R&D) funds.

Based on estimates for pent-up demand and potential R&D expenditures flowing to Florida, the panel estimates that about 2.9 million square feet of building space on 265 acres could be absorbed at the ISRP over a 20-year period.

Potential users would come from a variety of academic fields and R&D-related industries such as research science, flight hardware and product development, and other disciplines.

To attract the appropriate users, the park should position itself as the world's premier R&D facility focusing on spaceport and range technology and should feature a campus-style setting with a secure, nurturing, and collaborative atmosphere.

Planning and Design

A series of conceptual plans—including a concept master plan, a land use plan, a parcel plan, and a roads and open-space plan—illustrate the panel's recommendations for development of the 400-acre project site.

The ISRP is envisioned as a campus with a hierarchy of streets and a range of building parcels configured and arranged to allow maximum flexibility for different types and sizes of users. A unifying element for the park is a central greenway that would preserve environmentally sensitive areas while providing a natural setting and recreation opportunities.

Phasing of the development is planned to minimize infrastructure costs and disruption in the early stages. The Phase I plan includes the main entry from Ransom Road and a double-looped road that can become part of a larger system in later phases.

Development Strategies

The panel developed a management structure and phasing strategy for the ISRP based on the legal and regulatory constraints, as well as the authorities, that apply to KSC.

The fundamental issue related to implementation of the ISRP proposal is funding. Direct funding for KSC comes from U.S. congressional appropriations and is limited in scope. Scoring by the Office

The panel visited the launch pad of Space Shuttle Mission STS-104 two days before its launch on July 12, 2001.

The site (right) of the proposed International Space Research Park. The Vehicle Assembly Building (far right) is one of the largest-volume buildings in the world. Originally built for assembly of Apollo/Saturn vehicles, it was later modified to support space shuttle operations.

NASA

of Management and Budget, as defined in the Budget Enforcement Act, is also a potential limitation to undertaking a real estate development.

It is clear that KSC will need to partner with the private sector to provide the required development funds for the project. To make the project as attractive as possible, it must be structured as a long-term deal, and KSC will have to cede some control over the property to the partner.

In addition, to succeed fully, the ISRP must encompass research, technological development, and education. A major on-site academic facility for higher education is essential to attract research and technology users and to enhance the image of the development.

Given the constraints and authorities that apply to KSC, the panel recommends that the 400-acre ISRP site be conveyed via a ground lease of about 50 years to the Spaceport Florida Authority, or a similar entity, which would then sublease the land to a master developer from the private sector. At the end of the lease, which might also have a clause for a 50-year extension, the land and improvements would revert to KSC.

In-house real estate expertise must be acquired by SFA as a condition for receiving the ground lease from NASA and for structuring the ultimate development deal with the master developer.

Implementation

The panel suggests that implementation of the ISRP plan should focus on four fundamental contributors to success:

- Economic viability;
- A master developer;
- Local stakeholder collaboration; and
- A simple and fast development approval process.

Because the ISRP project is not likely to be economically viable in the short term, incentives will be needed to attract a private sector developer. These incentives should be distributed throughout the development period based on performance rather than structured as upfront fees. This will encourage the evolution of the project from a "fee development" model to one in which the developer has an equity stake and, thus, a vested interest in the project's long-term growth and success.

The panel identified a variety of potential sources for performance incentive payments for further investigation, including earmarking of sales tax revenues from the KSC Visitors Complex, the Visitors Complex capital fund, grants, donations, end-user payments, developer equity, and special district financing.

There are several compelling reasons for NASA to use a master developer for the project, including that such a developer has the experience and expertise to plan, finance, implement, and market complex real estate projects.

It is recommended that recruitment and selection of a master developer begin immediately. A four-step process will ensure conformity with NASA's goals while enabling a responsive, market-driven development process:

- Execute a memorandum of understanding to outline site conveyance and to allow developer selection to begin;
- Convey the site from NASA to SFA;
- Select a master developer from the private sector; and
- Execute a disposition agreement for the master developer.

Market Potential

Brevard County, as a whole, has a vibrant economy. Its economic base includes 243,000 employees, according to research by the panel, and the county's population of about 484,000 represents about 202,000 households. The real estate market has been growing, with the annual absorption of 3,800 housing units, about 200,000 square feet of office space, and 350,000 square feet of industrial space, including manufacturing, research and development, and warehouse and distribution space. Only a small amount of this growth has occurred in northern Brevard County, however. In fact, today the study area in northern Brevard County has only 341,384 square feet of office space, with 72 percent occupied, and 1.93 million square feet of industrial space.

Little or no industrial development has occurred in the past decade, and the industrial vacancy factor remains around 54 percent. This lack of commercial activity and high vacancy is of great concern to public officials, real estate investment entities, and economic development strategists.

Relevant Trends

The panel's outlook for market potential specifically related to the subject site is much more positive than for northern Brevard County. Recent technological advances and greater attention associated with NASA and, specifically, the Kennedy Space Center led the panel to look beyond the local real estate market and assess local and national trends to determine the opportunities for the proposed International Space Research Park as a result of the development and application of new technology.

NASA and Florida each have made a substantial commitment to enhance the role of R&D at the Kennedy Space Center through their commitment to the Space Experiment Research and Processing Laboratory. This facility, which will create about 100,000 square feet of educational R&D space adjacent to the 400-acre ISRP site, can have a catalytic effect on future R&D spending in the area, especially for the ISRP.

According to the National Science Foundation, $81 billion is spent every year in the United States for R&D, and $10.3 billion, or 12.7 percent, of that is dispersed by NASA. Based on trends from 1998 to 2001, the panel projects that these national R&D expenditures will rise 5 percent annually over the next decade. In recent years, Florida has received $3.1 billion annually of the national R&D disbursements, or 3.8 percent of the total—well below its share of the U.S. population, about 4.8 percent. NASA's current R&D spending in Florida is estimated at $408.7 million per year.

It is estimated by the panel that over the next decade, Florida will increase its capture of national R&D dollars to about its 5 percent fair market share, based on population, with R&D appropriations averaging $4.7 billion a year. This projection is based on Florida's increased investment in education and training, as well as its focused efforts to raise its stature as a center for research and technology. With NASA expected to be a significant conduit for these funds, it is estimated that R&D appropriations to Florida through the agency should average $639.4 million annually, growing by $44.1 million per year—an 8 percent annual increase in R&D funds. The panel estimates that 80 percent of the increase in NASA-funded R&D in Florida could be captured at the proposed ISRP.

Estimated Demand

The panel's estimate of captured R&D expenditures divided by average employee costs in the region indicates the addition of about 440 em-

ployees annually. Application of a typical square footage allotment of 280 square feet per employee to this figure and adjustment for other types of personnel indicates that the park should absorb an average of 116,000 square feet of R&D and related space annually on about 10.7 acres. Thus, a projection over 20 years indicates that about 215 acres would be needed to accommodate the projected R&D market at the ISRP.

This projection for the annual absorption of R&D square footage was substantiated by interviews with prospective users, who suggested that pent-up demand exists and can be expected in the future. Four prospects confirmed that they are committed to developing R&D facilities; they suggested that initial support exists for a first phase covering 30 to 50 acres that would include three to four ten-acre parcels for single tenants each needing 100,000 square feet of space and two five-acre parcels for single tenants each needing 50,000 square feet of space.

With consideration for the pent-up demand, about 265 acres of land dedicated to R&D could be absorbed within 20 years, which would result in construction of about 2.9 million square feet of building area accommodating about 10,300 employees. It is assumed that the majority of these would work in R&D-related industries.

Other land uses also will become viable and will be needed to support future R&D uses. Based on interviews conducted with experts in the field, a campus for a university offering advanced degrees appears warranted on about 30 acres. A 300- to 500-room hotel or lodging development with conference facilities would be justified on a five- to eight-acre site, especially in an all-suites or extended-stay format. This facility would complement a lodging development anticipated at the KSC Visitors Complex, but would be targeted to ISRP business needs.

A 60,000- to 80,000-square-foot combination athletic club/wellness center/medical clinic also should be considered as an early-phase recreational/service amenity on a six- to eight-acre site. Other possibilities could include high-quality, tenant-supporting uses such as restaurants and financial services, personal services, and auto-related businesses. These uses, which should be programmed in a strategic location that may encompass three to five acres, would add considerably to the appeal of working at the ISRP. In total, 316 acres of urban land uses are anticipated to be required over a 20-year absorption period.

NASA

Space shuttle *Atlantis*, seen from above, was launched July 12, 2001, with a crew of five and a joint air-lock module as its primary payload.

NASA

The Astrotech satellite processing facility is located in the Spaceport Commerce Park in Titusville, just west of the Kennedy Space Center.

The development program for the ISRP anticipates the need to accommodate more than 10,000 new employees, which would be a tremendous stimulant to the nearby housing, retail commercial, and business markets. At buildout, the R&D park alone could create the need for more than 7,200 homes, based on an employment participa-

20-Year Summary of Land Use Potentials for the ISRP

Type of User	Approximate Size	Acreage
Research and Development	2.9 million square feet	265
Higher-Education Campus	100,000–200,000 square feet	8–10
Hotel/Conference Center	300–500 rooms	5–8
Athletic Club/Wellness Center/ Medical Clinic	60,000–80,000 square feet	6–8
Tenant-Supporting Service/ Commercial Businesses	10,000–20,000 square feet	3–5
Total	**3.17 million–3.35 million square feet**	**309–316**

Source: Panel research.

tion rate of 50 percent and an average household size of 2.9 people. Multiplying the number of households by the annual national average household expenditures on retail goods—$11,800—points to demand for retail facilities to serve anticipated spending exceeding $85 million per year.

Projections for market demand can be tested and confirmed through advance marketing of the project. The panel strongly recommends that tenant commitments be secured for land and building space before infrastructure construction begins. An aggressive preleasing campaign should be developed and executed as soon as possible to confirm short- and long-term demand forecasts.

Potential Users

The demand for space in the ISRP will come from new, "induced markets" attracted by the unique character of the development. This is in contrast to a typical business park, which would expect to capture a portion of users already present in the market. Initial users will be those with NASA, International Space Station, and related contracts and those that will benefit from the collaboration with and proximity to other park users.

Many users may come from outside the region, the state, or even the country. Some users initially may seem out of place, but may collaborate with one or several other users to conduct research and create applications not currently imaginable. Innovation in Silicon Valley is an example of how this collaboration can create new products and processes.

Potential users may come from a variety of industries and activities, some of which have not been created or even dreamed up yet. There can be many targeted tenant categories, such as research scientists, flight hardware and product development and application companies, and users of clean space. However, manufacturing or assembly activities may be inappropriate for the character, safety, and goals of the park.

Potential users of the R&D park may include:

- The ISS, Cape Canaveral Air Force Station, and international support partners;
- Technology transfer businesses;
- Ground control operations and support organizations;
- Space tourism–related businesses;
- Pharmaceuticals, biotechnology, biomedical, life sciences, and genetics companies;
- Electronics companies;
- Telecommunications companies;
- Laser and optics firms;
- Aeronautics, stealth technology, radar, and sonar companies;
- Weather, navigation, and telemetry companies;
- National security intelligence and artificial intelligence firms;
- Imaging and simulator R&D firms;
- Software developers, microprocessor and chip developers, and computing services firms;
- Fuel and chemical research firms;
- Metallurgy and microgravity construction firms;
- Transportation and automotive product companies;
- Energy generators;

- Agriculture companies;
- Grant providers and national and international universities, colleges, and employee training companies;
- Incubator space and full-service offices; and
- Tenant-supported retail businesses (food carts, dry cleaners, daycare, etc.), a hotel, a conference center, and dormitories.

Creating a Competitive Edge

The ISRP will have a strong competitive advantage due to its association with the prestigious KSC and the potential for a collaborative environment that creates new ideas, solves problems, and mitigates risk. As KSC's importance in spaceport and range technology grows, the ISRP's proximity to launch sites will add to the attractiveness of locating there.

To attract users and ensure both short- and long-term success, the ISRP should:

- Position itself as the world's premier research and development facility related to spaceport and range technology;
- Provide a secure, nurturing, and collaborative environment;
- Employ a campus-style site plan;
- Create a mixed-use development anchored by SERPL and the KSC Visitors Complex;
- Create connections to SERPL and other anchor tenants so a maximum number of users can benefit from synergy among the facilities;
- Share amenities with the Visitors Complex while maintaining autonomy and on-site security; and
- Minimize upfront infrastructure costs while creating momentum with an initial success.

An aggressive "build-it-and-they-will-come" approach may be needed to create the critical mass of users necessary to produce initial success, but limited funds may hinder this approach in the early phases. SERPL can help serve as a powerful anchor tenant and magnet for other users, so strong connections should be forged between it and the ISRP. Additional anchors should be located in secure, central locations near the park's main entrance.

LAURIN McCRACKEN

A conceptual view of the entry to the proposed International Space Research Park.

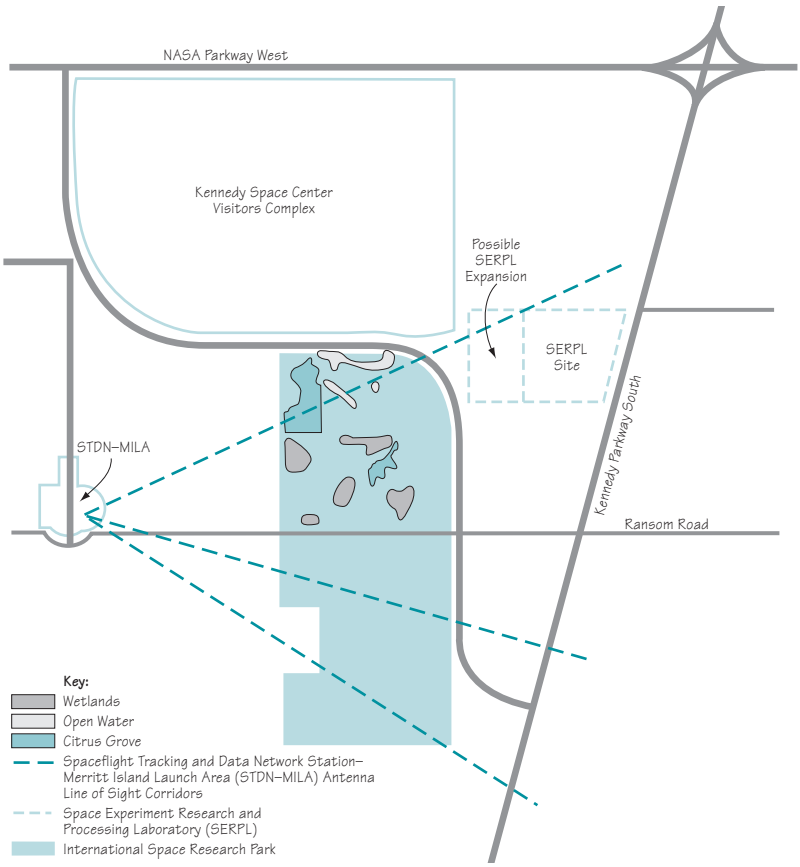
In summary, the panel believes there is strong short- and long-term market demand for the lease or purchase of building space and land at the proposed ISRP. Commercial success at the park can support and encourage greater emphasis on privatization, commercialization, and partnerships at KSC.

Planning and Design

The 400-acre site designated for development as the International Space Research Park is located at the Kennedy Space Center, immediately south of the KSC Visitors Complex. It is near the intersection of NASA Parkway West, a limited-access, divided four-lane road, and Kennedy Parkway South (State Road 3), also a divided four-lane road. A new four-lane, controlled-access road currently under construction will provide direct access to the site.

The site, relatively flat and five to six feet above sea level, is within the Merritt Island National Wildlife Refuge. Over the years, however, much of the area has been disturbed from its native condition through citrus production. Several orange groves on the site are part of the Kerr Center for Sustainable Agriculture studies program.

Site development constraints.



A variety of factors at the site may affect development and must be considered in the planning and design of the ISRP. For instance, it has been estimated that there are 12 acres of wetlands on the site, but this needs to be verified by state and federal agencies. In addition, land will need to be dedicated for stormwater management, and, because the site is within the 500-year flood plain, future building pads must be five to six feet above the existing ground level.

There are no utilities immediately available on the site; all major services such as electricity must be run from Kennedy Parkway, along Ransom Road, a distance of approximately 1,800 feet. Fiber-optic cable, digital subscriber line (DSL), and cable service also must be supplied to the site.

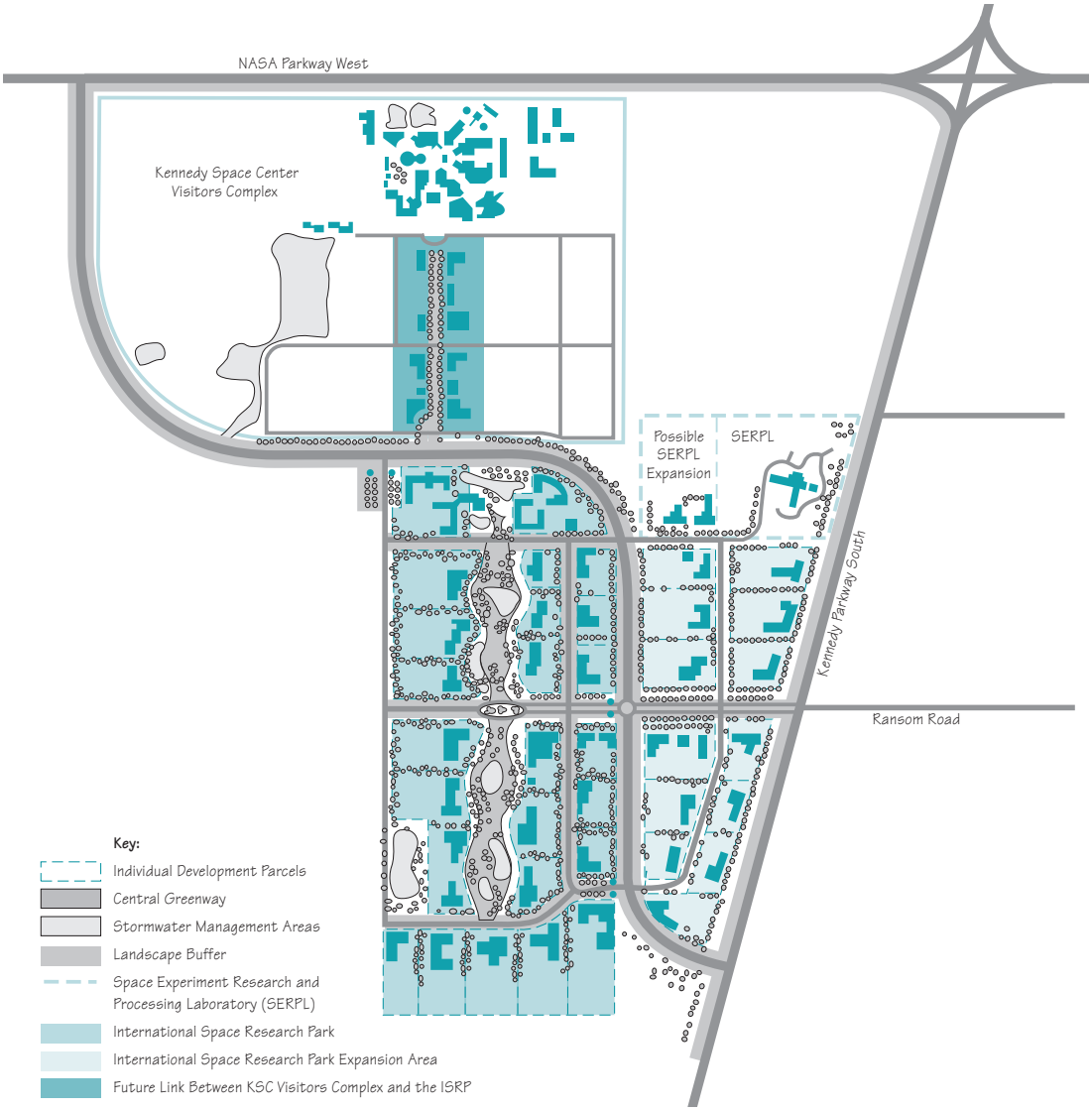
West of the site is the Spaceflight Tracking and Data Network Station–Merritt Island Launch Area (STDN–MILA). This NASA tracking facility maintains critical instrumentation lines of sight to spacecraft at the various launch towers and other selected buildings. There are three STDN line-of-sight corridors crossing the ISRP site that will limit building heights within those corridors to 30 or 70 feet, depending on location, according to information provided to the panel.

Design Goal and Principles

The goal of the conceptual master plan prepared by the panel is to provide a strong identity for the new ISRP. More than just a collection of development parcels, the proposed development is intended to provide:

- A sense of place;
- Clarity of organization;

Concept master plan.

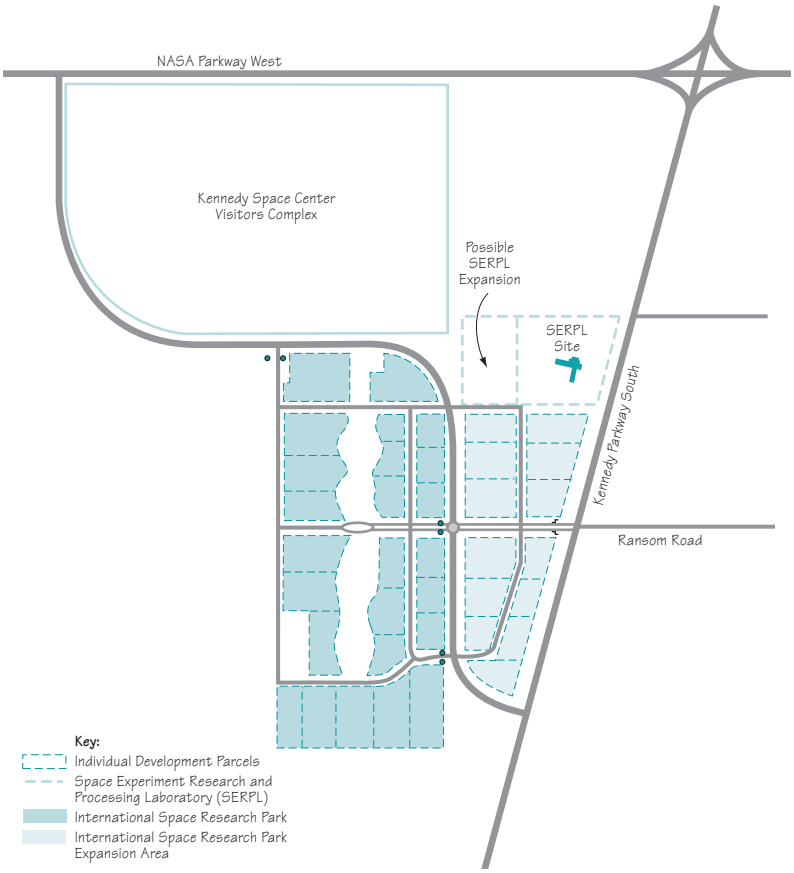


- A flexible and phased development approach; and
- An environmentally responsible plan.

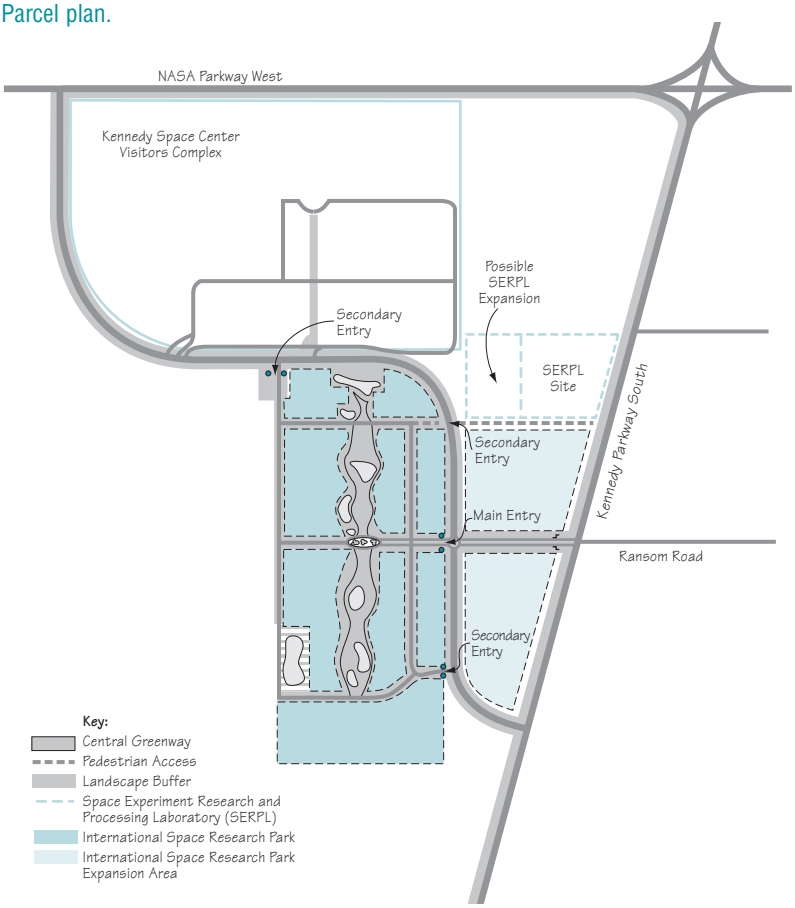
Concept Master Plan and Parcel Plan

The concept master plan prepared by the panel for the ISRP envisions a campus setting with a hierarchy of streets and a range of parcel sizes related to their position within road and open-space systems. Using a model of five- and ten-acre sites, the plan was developed to create opportunities for phasing and maximum flexibility for different types and sizes of businesses. Sites could be combined or divided based on user requirements.

A unifying element for the park is a central greenway, a large open space that will serve a variety of functions. It will protect and enhance existing wetlands and wet areas to the highest degree possible, while helping to accommodate stormwater management. The greenway also will help promote a sense of arrival and place at the park and at individual building sites. As a natural area planted with native flora, including pines, willows, oaks, myrtles, and palms, it will provide an upscale image, as well as a recreation opportunity



Parcel plan.



Roads and open space.

for park tenants. In conjunction with the internal road and pathway system, it also will provide a spine for the entire development.

To create the quality and image of a private R&D campus, lot coverage (building footprint divided by lot area) should not exceed 45 percent. Site planning should offer maximum flexibility in order to accommodate future or currently unknown activities. Buildings also should be designed to take advantage of the major open-space amenities, such as the central greenway.

Road System and Open Space

The internal streets and open spaces planned for the ISRP, including the greenway, will work together to create a clearly defined system of access and a sense of place throughout the site.

The primary entry to the park is planned from Kennedy Parkway along an improved Ransom Road, with landmark signage on the parkway and at the entrance helping to identify and to distinguish the development. As part of this improvement, the existing reclamation area near the site should be relocated and the corrosion-control facility should be properly fenced and naturally screened to create the right "business-in-a-natural-setting" image for the park entry.

There will be three additional entries, at the southern and northern portions of the site, via the new road being built. Within the park boundaries, a loop system of roadways will ensure that there is an efficient flow of traffic serving all areas of the park.

In the early phases, structured parking should be avoided, if possible, to keep costs down; however, it may be required in later phases. Industry standards for R&D complexes call for three to four parking spaces per 1,000 square feet of office space.

Land Use Plan

R&D activity is planned as the predominant use at the ISRP. Other tenant-serving uses that would increase the desirability of the development for users include a hotel and conference

facility and a higher-education campus proposed for the northern edge of the site near the Space Experiment Research and Processing Laboratory and the Visitors Complex. Other uses geared to the occupants of the park—including an athletic club/wellness center/medical clinic and a service-oriented retail center—would be centrally located at the confluence of the main access roads.

Phasing

The panel created a phasing plan to minimize infrastructure cost and disruption in the early stages of the proposed development. The Phase I plan includes the main entry from Ransom Road and a double-looped road that can become part of a larger system in later phases. This area was designated for the first phase because it provides a unique point of entry into the park and is also the primary point of connection with utilities that will be run from Kennedy Parkway. About 13 building sites are indicated in Phase I, but this figure is flexible and can be adjusted to meet market needs. Construction of the connecting road to SERPL also is indicated.

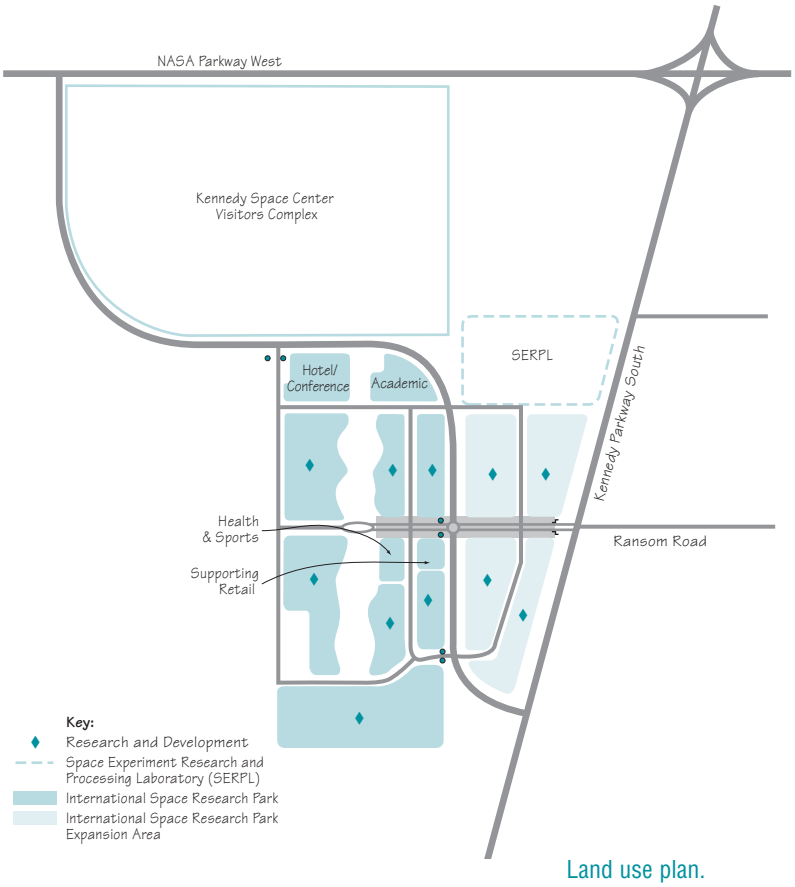
Additional Studies Required

A number of studies must be undertaken before detailed planning of the ISRP can begin. They include the following:

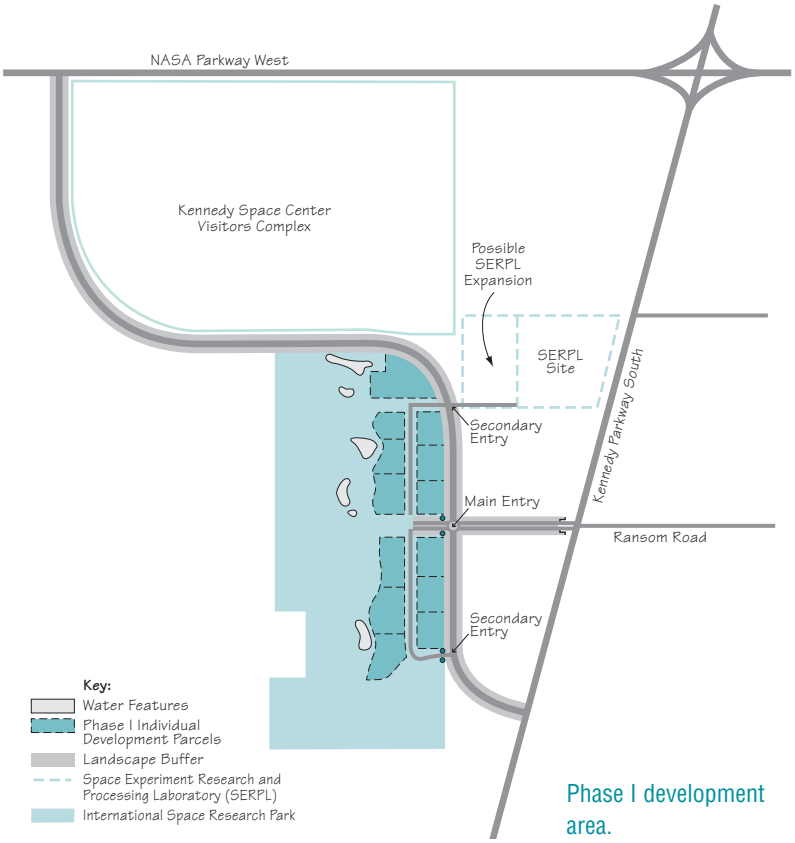
- Detailed mapping of wetlands, wet areas, and significant vegetation;
- Topographic mapping;
- Soils studies;
- Hydrology studies; and
- An infrastructure needs and assessment study.

Sustainability

It is of paramount importance that the entire park development represent the best in sustainable design and construction applications. In addition to parks, the greenway, and trails, all individual projects at the site must have a minimum of 30 percent open space and no more than 40 percent devoted to parking and hard surfaces. The Den-



Land use plan.



Phase I development area.

The Space Experiment Research and Processing Laboratory

Through a federal/state government partnership, NASA/the Kennedy Space Center (KSC) and Florida are jointly developing the Space Experiment Research and Processing Laboratory (SERPL). This 100,000-square-foot facility, intended to serve as a magnet for future research and development activities at KSC, will be used for activities related to life sciences research and the processing of International Space Station payloads. The Florida Space Research Institute is coordinating use of the building for university research and development, which is estimated to account for approximately 20 percent of the total building area.

FLAD & ASSOCIATES

The Space Experiment Research and Processing Laboratory will serve as a magnet for future research and development activities at the Kennedy Space Center and will help attract prospective users to the International Space Research Park.

The panel acknowledges the significance of the partnership effort by NASA and Florida and the importance of this anchor project to the overall achievement of NASA's twin missions of leadership in space-launch operations and preeminence in spaceport and range technologies. In fact, many of the panel's implementation recommendations for the International Space Research Park (ISRP) are based on the successful execution of this partnership.

The panel recognizes that significant amounts of time, study, and money have been expended by the partners, as well as by prospective tenants, in the development of the SERPL project. It also understands that the design and engineering of the facility has necessitated strong emphasis on the important operational characteristics of the facility, not the least of which are external security and the protection and containment of internal functions.

Currently, the two- to three-story SERPL facility is designed for construction on a 40-acre site just off Kennedy Parkway and northeast of the ISRP site. Although this location is near the proposed ISRP facility, the two sites are to be separated by undeveloped land and a new road, now under construction. Because SERPL was conceived and planned as a stand-alone project before serious consideration was given to the development of a nearby research park such as the ISRP, the two facilities, as now planned, do not take maximum advantage of the synergistic research and sharing opportunities available to them.

The panel believes that greater physical and visual integration of SERPL and the proposed ISRP are crucial to the commercial success of the ISRP, particularly in its early stages. The 100,000-square-foot SERPL facility should serve as a Phase I anchor tenant for the ISRP, conveying a highly visible message that the development of research facilities at KSC is not speculative.

SERPL also will help attract prospective ISRP occupiers whose business functions complement SERPL's research functions or who may wish to share in the prestige associated with a major research facility. Both facilities will benefit from access to hotel/conference and academic uses proposed for the northern portion of the ISRP site.

Greater integration of the ISRP and SERPL planning processes would enable the two facilities to share in expenditures for infrastructure such as roadways, utilities, and stormwater and sewer systems. One important benefit of these cost savings would be the real possibility of lowering land costs within the ISRP. This would tangibly enhance the park's financial attractiveness to developers and users alike.

Security is recognized as an important consideration for the design and operation of SERPL. However, there are many examples throughout the country of high-security R&D and business parks where security and operational requirements not dissimilar to those of SERPL are not compromised by seamless integration into the surrounding business and corporate-campus environment.

Based on current plans and security measures, the panel recommends the following actions to help achieve greater integration of SERPL and the ISRP. These actions should be considered in the earliest stages of SERPL site work and construction to ensure that they can be implemented in the future.

- Create a visual connection between SERPL and the ISRP through landmark signage and landscaping. In the short term, this will involve careful site design and landscaping at the western edge of the SERPL site so that it does not appear to be a "back door" to the ISRP.
- Create a physical pedestrian link between the two areas. In its simplest form, this would include providing paved walkways or extending the ISRP's planned central greenway to the east. As the ISRP expands, this might include the construction of an underpass or the implementation of a transport system such as electric cars between the two areas.
- Plan for greater integration in future development phases by creating building parcels to the west and south of SERPL. Filling in the areas between SERPL and the ISRP with complementary development will create a bridge between the two areas and will overcome the image of SERPL and the ISRP as stand-alone facilities.

ver Tech Center is a good corporate campus model. Other notable examples include the Research Triangle Institute in North Carolina, the Princeton Forrestal Center in New Jersey, the Stanford Research Park in California, and the University Research Park at the University of California at Irvine. In the private sector, good examples are Technology Park/Atlanta and the Merrill Lynch campuses in Jacksonville and Newark.

Development Strategies

There is a variety of issues that the Kennedy Space Center should consider as it addresses the appropriate development strategy for the International Space Research Park. The panel considered the specific constraints and authorities that apply to NASA and, based on this, developed a management structure and phasing strategy for the ISRP.

Legal and Financial Authorities

To understand the types of management structures that are viable for the ISRP development project, one must understand the legal and regulatory constraints under which KSC operates, as well as the authorities and other resources that KSC has at its disposal to pursue this effort.

The first constraint relates to the type of funding KSC receives. KSC's direct funding comes from U.S. congressional appropriations and may be used only for mission- and support-related activities. Use of operations dollars even to pay for a fee developer's services or to create an ISRP master plan and site plan probably is not feasible due to the scarcity of funds. Extension of the infrastructure to and throughout the ISRP site would require the use of construction of facility (C of F) funds that currently are directed toward other projects.

Another potential fiscal limitation to certain management structures is "scoring" by the Office of Management and Budget (OMB) as defined in the federal Budget Enforcement Act. Designed to account for any contingent, future liabilities the government may face as a result of decisions agencies and departments make today, scoring addresses the tendency of agencies to commit the government to long-term "operational" leases extending across several decades, thereby circumventing the normal government process for obtaining funds for capital expenditures.

The OMB in its management role reviews long-term projects presented by government agencies to determine whether the project follows the letter and the spirit of the Budget Enforcement Act. To the extent that the OMB believes that a project commits the government to a future obligation or is an attempt to circumvent normal budgetary controls (e.g., the project involves a lease purchase), the OMB will calculate a "scoring" amount that requires the agency in question to furnish out of current-year funds an amount equal to the project's "score."

This requirement makes many long-term projects unaffordable. Recognition of the difficulties that were encountered in crafting documents for the Space Experiment Research and Processing Laboratory to avoid the negative scoring potential of that major real estate commitment led the panel to pay particular attention to the scoring impacts of the ISRP project.

KSC also has several legal and financial authorities that may have a material impact on the viability of the ISRP development project. They include NASA's authority under Section 2473, Subsection C(5), Title 42 of the U.S. Code to enter into leases with government or private entities. The panel's research showed that Title 42 applies and that KSC has the authority to sign a long-term ground lease with a development entity. Following the precedent of other federal agencies, the lease term could be for as long as required to enhance the financial viability of the development. The panel suggests that this be a minimum of 50 years.

NASA also has the authority to establish concessions on its grounds. This authority, which dates back to the 1958 National Aeronautics and Space Act, was used to create the KSC Visitors Complex, which is operated by Delaware North.

Within the current concession agreement, signed in 1995, is a provision that divides the residual

revenue (total revenue minus expenses) among the U.S. treasury (which receives the first $50,000), the contractor, and a capital improvements fund over which KSC has influence. While the fund cannot be used indiscriminately, if a link such as shared conference facilities or an interpretive center can be established between the Visitors Complex and the ISRP, it may be possible for some of the funds to be used to enhance the ISRP site or to extend and improve the site's infrastructure.

Such a use clearly would require that there be close coordination between KSC and Delaware North and that a physical and business connection be established between the Visitors Complex's mission and the space-related research to be conducted at the ISRP. However, use of the capital improvements fund may offer a vehicle to reduce the financial burden on the ISRP, particularly in upfront costs such as infrastructure.

Also, research by the panel indicated that some expenses incurred by KSC as a result of activities conducted by private entities at the center may be reimbursed directly to KSC and retained by it. However, it appears that such reimbursements have significant constraints attached to their reuse, so this authority is unlikely to add any significant financial advantage to the creation of the ISRP.

Most base-operations support services at KSC have already been outsourced via a joint base-operations support contract. This contract would provide the vehicle to capitalize on economies of scale by adding to the contract, at no expense to NASA, services performed at a contiguous site, such as the ISRP.

As background to its recommendations, the panel considered the precedent established by other agencies, notably the Department of Defense (DOD). As an example, after determining that some of the services it provides are not part of either its core mission or its core competencies, the DOD decided to privatize these types of services and concentrate its efforts on what it does best.

In 1996, Congress granted the DOD, via the Military Housing Privatization Initiative Act, certain authorities that have enhanced its ability to privatize the development, improvement, and operation of its housing assets. The authorities allow the DOD to engage in private sector partnerships, to convey assets, to obtain low-cost direct federal loans, and to provide limited loan guarantees. These authorities, in conjunction with the Credit Reform Act, mitigated some of the most onerous OMB scoring constraints under which NASA now operates.

In contrast to the DOD, KSC is seeking to leverage two assets—its land and its brand name — to enhance private sector research, technological development, and education applicable to its mission. The panel believes that NASA should take the initiative to obtain through legislation some of the same authorities that the DOD has received to enhance its privatization efforts. Such authorities would augment the current authorities KSC can use, and would improve the privatization options available to it.

Funding

With an estimated requirement of about $100 million for the first phase of development (excluding infrastructure work, but including site preparation and actual construction), the fundamental issue facing implementation of the proposed ISRP is funding. This issue includes not only the availability and level of funding resources, but also the ability of KSC to apply the funds it controls to the ISRP.

KSC has two basic types of funds, both of which are appropriated by the U.S. Congress. The first, operational funds, are two-year funds; for fiscal 2002, KSC's operations funding level is expected to be $1.6 billion. The second source, C of F funds, have no expiration date once appropriated, but are very scarce; for this year, the Kennedy Space Center has C of F funding of $37 million. This type of funding would be required for a real estate development such as the ISRP, but given the nature of the project, the ability of KSC to apply any of its appropriated C of F funds to this area is problematic at best.

Left: (From left) Anne Frej, Laurin McCracken, Ed Gormel, Jan Heuser, and panel chair Alex Rose. Panel members provide background on the proposed International Space Research Park to Gormel, executive director of the Spaceport Florida Authority, and Heuser, KSC program manager. Right: Discussing development strategies for the International Space Research Park are (from left) panel members Charles Long, Barry Scribner, Ehud Mouchly, and John Prosser.

Thus, KSC will have to rely on the private sector to provide the bulk of the required development funds for the ISRP project. Given the current state of the commercial real estate market (i.e., the necessity to create demand in the early stages coupled with high upfront costs), development of the ISRP site must be deliberate and phased.

Moreover, any real estate deal must be structured so that the financial viability is enhanced as much as practicable. This means that any real estate structure must be long term in nature. It also means that KSC will have to cede some control over the property to attract capital to the ISRP and to ensure its ultimate market and financial success.

Given the investment that will be necessary to attract initial users, it cannot be assumed that a developer will be able to provide the necessary funds for the entire site. With the cost for infrastructure as high as $1.50 to $2 per square foot of land, the outlay for an initial phase including three tenants and a university anchor tenant using 30 to 50 acres easily could be more than $2 million.

There are indications that the state may be willing to provide seed money at that level; although this does not indicate a commitment for the funding, it does present an avenue worth exploring for some initial investment. Additional sources of revenue may come from donors that have an interest in KSC's enhanced mission and that would benefit directly from a successful ISRP development. In the case of donors, the university fundraising model of designating specific projects for contributions, as opposed to a general fund, may be effective.

Desirable Uses

To succeed, the ISRP must encompass three components—research, technological development, and education. The research component may be satisfied at an early stage by one or more of the private companies that have indicated an interest in occupying space at a facility such as the ISRP. However, technological and educational uses must come at the same time or immediately afterward if KSC is to enlarge its focus from launch industry to research and development. In particular, a major higher-education presence on site is essential to delivering quality, postgraduate studies and technical-skills enhancement to KSC, the Cape Canaveral Air Force Station, and the local and regional community.

Academic facilities will be the strongest bridge to integrate SERPL, the ISRP, the Visitors Complex, the conference center, and the hotel. With a true research environment in place, NASA, which awards contracts and grants to an average of 750 colleges and universities annually, could tap an assortment of academics to do the studies in situ. The task of attracting such a university tenant has been made somewhat easier by release of a June 11, 2001, memorandum by the OMB stating that KSC's core mission should evolve to include a significant research effort. This change in mission philosophy could help to create an environment for both NASA and potential tenants to adjust their attitudes about the ISRP development effort.

Community Issues

A caution must be raised about the concerns of adjacent neighbors. While they appear at present

to approve of the ISRP project, area homeowners and some economic development officials have expressed special interests and concerns regarding the proposed park.

The North Merritt Island Homeowners Association, which has about 2,700 members, has expressed concern regarding the impact of development in this area. While 60 percent of the homeowners work at either KSC or the Cape Canaveral Air Force Station, they want to protect their rural lifestyle. Among their concerns are the types of businesses that might locate at the ISRP and the 24-hour access through their area that a new road will permit. In general, however, the local community is likely to appreciate the potential for increased commercial amenities, job opportunities, and other economic benefits from the project.

To foster good relations with community residents, the panel urges that ongoing, direct communication be established from the outset by KSC with a cross section of stakeholders. It is strongly recommended that a project Web site be set up as soon as possible and that other community outreach programs be initiated. Also, a deliberate, phased development plan will help to create a community consensus on the project by giving the development team the opportunity to build project support among important stakeholders at each stage in the process.

A goal cited as important by local officials was that there be balanced growth at all business parks in the area. Phasing the ISRP, populating the first phase with potential private tenants that already have expressed a desire to locate specifically at KSC, and establishing a university presence early will address local concerns that the ISRP will take businesses away from existing office and business parks in the area.

A phased approach also mitigates potential impacts to the existing road network. Currently, the roads around the site are sufficient to handle an initial phase of development, but higher traffic levels in later phases could overwhelm the transportation system in and around the ISRP. Based on experience at other R&D campuses throughout the country, the completed buildout on 400

Alex Rose presents the team's recommendations at a presentation at the Kennedy Space Center.

acres, added to the traffic from tourists at the Visitors Complex, could create traffic problems on the roads providing access to the site. Early planning should be undertaken to avoid such future road deficiencies.

Recommended Management Structure

Given the constraints and authorities available to KSC for creation of the ISRP, the panel recommends that the 400-acre ISRP site be conveyed via a ground lease of about 50 years to the Spaceport Florida Authority, contingent upon SFA adding in-house real estate development expertise. Once the ground lease has been granted to SFA, it would sublease the land to a private developer.

KSC, while not involved in day-to-day operations, would retain control over the underlying ground lease. At the end of the lease period, which might also have a clause for a 50-year extension, the land and improvements would revert to KSC.

The panel believes that this lease structure will keep the risk of unfavorable scoring to a manageable level, because there will be no contingent governmental liability associated with what, in effect, will not be a federal government operation. However, an issue that must be addressed is maintenance requirements for site improvements that would revert to KSC when the lease ends. It is worth noting that there is also precedent under the SERPL agreement to use a leaselike mechanism.

A long lease period is suggested for several reasons. Land leases of 50 years or longer are customary in private real estate and capital markets, and a 50-year lease has precedent in the privatization deals being crafted by the DOD. The financial

The site of the proposed International Space Research Park is within the Merritt Island National Wildlife Refuge. This 140,000-acre area, which includes the Kennedy Space Center, provides a buffer zone for NASA activities and a habitat for endangered and threatened species.

requirements of the deal's structure necessitate the longest period of loan amortization possible to preserve cash flow.

There is precedent for loans of up to 35 years, and debt sources have shown a willingness to impute an ownership right on developers who retain a leasehold interest in property for ten years beyond the debt amortization period. This, in turn, translates into the potential for a more favorable interest rate for the project developer.

Another issue that must be addressed is the applicability of the Davis-Bacon Act, which requires the payment of prevailing wages and benefits to workers employed by contractors and subcontractors engaged in federal construction projects. Under the recommended management structure, compliance with Davis-Bacon would lie with the developer, who would be responsible for resolving any employment issues.

Additionally, the management structure should include provisions allowing for such things as separate maintenance, utility services, and access control so that all ISRP tenants will be able to function regardless of the status of the KSC/Cape Canaveral Air Force Station launch operations or other conditions related to security. In light of the events of September 11, 2001, any potential debt sources available to the developer will be interested in the specifics of these provisions.

Implementation

The ULI panel suggests that implementation of the International Space Research Park plan focus primarily on four fundamental contributors to success:

- *Economic viability.* The project will not be self-sustaining for some time—perhaps five to ten years. Although this will necessitate initial use of a "fee developer" model, a compensation program based on performance can start the project toward a conventional, self-sustaining "equity developer" model as soon as practicable.
- *The master developer.* It is vital to the project's success that it harness the experience and expertise of a private sector master developer at the earliest time possible. This will be difficult to accomplish because of the cumbersome nature of federal procedures for conveying real property. To mitigate this problem, it is recommended that NASA convey the site via long-term ground lease to a local partner, the Spaceport Florida Authority, and rely on this partner to select the developer and conduct all contracting.
- *Local stakeholder collaboration.* The project has many friends within the community who want to help and who could assist in solving problems, but they need a forum for sharing information and developing a consensus on how they can best assist the project. It is suggested that NASA form and support such a forum.
- *A simple, fast approval process.* Success in real estate development depends on certainty and the ability to capitalize on opportunities quickly. The panel suggests that NASA delegate its control over the site so that decisions can be made with minimal delay and within a framework of accountability.

In addressing these four issue areas, NASA should follow two guiding principals: first, build partnerships with all stakeholders in the project; and, second, maximize the delegation of decision making within a context of accountability.

Fortunately, the proposed ISRP project can benefit from an evolving federal, state, and local partnership committed to strengthening the Kennedy Space Center/Cape Canaveral Air Force Station as an economic engine of central Florida. This partnership will be critical in addressing the project economics and selection of a master developer, and NASA's implementation strategy should strengthen and enliven these partnerships so that all parties are informed and can contribute. Perhaps the most important partnership tactically will be with the private master developer: only a private developer has the expertise necessary to craft solutions to the detailed development issues.

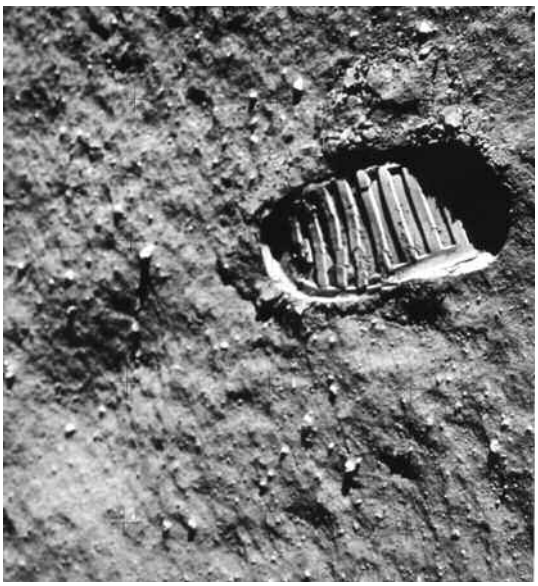
Delegation is the key contributor to timely action. To achieve speedy performance and accountability, NASA will need good contracts and strong, competent partners. The panel's detailed recommendations are designed to achieve this goal.

Economic Viability

The potential exists for the ISRP to function as an economically viable project. However, the project faces significant economic challenges that indicate it will not be self-sufficient in the immediate future. Of these, three challenges are most significant:

Problematic Land Values

Due to low land market values in the region, a limited ability to charge and/or raise rents, and relatively high development costs for the ISRP, the market value of the land in the park is actually negative, pointing to substantial developer risk in the absence of incentives.



NASA

Footprints were left in the lunar soil when Neil Armstrong and Buzz Aldrin landed on the moon on July 20, 1969. After takeoff from the moon on July 21, they joined Michael Collins in the Command Module circling the moon. The astronauts splashed down in the Pacific Ocean and were recovered by the U.S.S. *Hornet* at 12:50 p.m., EDT, on July 24.

Unusually High Development Costs

The absence of infrastructure, the expense of meeting environmental standards, and the high cost of the quality design needed to make the ISRP a world-class project will make building costs relatively high, driving up occupancy costs and, thereby, further increasing developer risk.

High Occupancy Costs for "Spoiled" Tenants

Many of the initially identified tenants for the park will be users relocating from other quarters on KSC or from within the region. These users are accustomed to occupancy costs that are zero or very low.

These and other economic challenges mean that developers face too great of a risk to develop the park without incentives. Consequently, there must be a source identified to fund these incentive payments until the project becomes self-sufficient, which may take five to ten years.

The panel suggests a combination of subsidies and incentives in order to attract an experienced and qualified master developer. Incentive payments should be based strictly on developer performance to foster the evolution of this project from a fee development model to an equity development model. Under this incentive-based model, the developer would receive performance payments only upon actual performance; the normal fee developer model involving upfront developer payments should be avoided. In addition, the performance payment schedule should be reduced over time to wean the project from incentive payments and to encourage a transition to a market-based project.

Several potential sources of funding for performance incentive payments have been identified:

- *Earmarking of sales tax from the KSC Visitors Complex.* A bill to create a capital fund for the space facilities at KSC and the Cape Canaveral Air Force Station died in the most recent session of the Florida legislature, but the case for reviving this legislation in the next legislative session is compelling. It could produce $4 million to $5 million annually for capital facilities related to space activities, and, in the panel's opinion, an appropriate allocation of half this annual amount to the ISRP for a period of up to ten years would provide adequate funding for an incentive program.
- *Use of the Visitors Complex capital fund.* Research indicates that this fund currently generates $5 million to $6 million of net capital funding annually that must be allocated to Visitors Complex–related activities. The case is strong for allocating a portion of this funding to incentives that foster the creation of the ISRP and the development of the region as a tourist attraction.
- *Grants.* In fiscal 2000, NASA awarded contracts totaling $100 million to 11 organizations for research and development. Some of this could be transferred into bricks-and-mortar projects and could be a source for capital funding for the ISRP.
- *Donations.* It is reported that Florida will match on a one-for-one basis funds donated for facility construction dedicated to space or education. The state also will contribute an annual amount for operations and maintenance to that matching amount. This funding opportunity may have particular appeal for potential donors who would be willing to contribute to an educational facility at the ISRP. This could be an inducement for an institution such as the University of Central Florida to raise the nec-

essary funding to create a presence in the research park or for organizations such as the Astronauts Memorial Foundation to get involved.

- *Foreign-government and/or end-user payments.* Many foreign governments or businesses have been using KSC facilities at low or no occupancy costs. There will need to be a concerted effort to market and to justify payment of occupancy costs in the ISRP to retain these users.
- *Developer equity.* The park should plan a transition to a conventional risk-based real estate model within ten years.
- *Special district financing.* Assessment bonds and other special district financing, industrial development bonds, and revenue bonds are types of tax-exempt financing instruments that will require specialized analysis of the assets or other security for repayment. SFA and the Florida Commercial Space Financing Corporation—an organization that provides information and technical and financial assistance to space-related businesses—are capable actors in this arena and can be relied upon to use these tools when applicable.

Several specific features of the panel's implementation design are crafted specifically to lower costs and enhance project economics. The phasing recommendations minimize holding costs and, thus, lower risk. In addition, the implementation structure envisions that the master developer is responsible for financing and installing infrastructure. Such a mechanism maximizes the speed of infrastructure installation and minimizes the potential that public sector contracting provisions will drive up costs and slow down installation.

The Master Developer

There are several compelling reasons for NASA to use a master developer from the private sector to develop the project. A successful private sector master developer has the requisite experience and expertise in planning and implementing complex real estate projects. The company or individual also has an ear to the market and knows how to manage projects with flexibility and anticipation of real estate markets.

A private sector master developer also will be able to market the project effectively to the types of users that can fulfill NASA's vision of a unique research and development center and will lend credibility to the project with investors, consultants, public sector officials, and others who will be involved in the development process. The presence of a private sector master developer also will strengthen project underwriting by private sector investors and lenders.

Recruitment and selection of a master developer should begin immediately so that the project can be planned with practical commercial input from the very beginning. A four-step process is recommended to ensure that NASA's goals for site development and land use are followed, and that, simultaneously, a responsive, market-driven development process is put in place.

Execute an MOU

As soon as possible, NASA and SFA should execute a memorandum of understanding (MOU) that outlines the selection process for the master developer and contains good-faith commitments to develop a site-conveyance document over the next 12 months. This MOU should contain sufficient affirmative language to allow the selection process to proceed without waiting for the site to be conveyed formally from NASA to SFA, which, unfortunately, may take a long time. The MOU also will reassure the master developer candidates that they are not wasting their time by pursuing the project.

Convey the Site to SFA

Immediately after executing the MOU, NASA and SFA should begin work on a formal agreement giving SFA site control within clearly stated development criteria. (For the Space Experiment Research and Processing Laboratory, the conveyance document is called a "real estate use permit agreement," a term used by NASA and SFA to describe what for all intents and purposes is a ground lease agreement.) Under this agreement, the entire parcel designated for the ISRP would be conveyed to SFA for subsequent reconveyance to the master developer. By the time the agree-

LAURIN McCRACKEN

A conceptual view of the landscaped greenway, planned as the spine for the International Space Research Park, which would help establish the park's image as a world-class research and development center.

ment is completed, the master developer will have been selected and have been able to provide input to the process. The de facto ground lease agreement should include at least the following items to govern SFA's disposition of the site:

Term of Lease. A lease term of at least 50 years, or preferably longer through options, should be set to permit easier financing for the development. SFA then can proceed to negotiate and execute a ground lease with the selected master developer that will be governed by the provisions of the ground lease between NASA and SFA.

Performance Schedule. A performance schedule governing both SFA's performance and that of the master developer should be established. These performance requirements should require SFA and the master developer to meet infrastructure-installation and occupancy goals within defined periods of time.

As an example, the performance schedule could require that the developer achieve at least a 15 percent buildout and leasing of the property within five years. If this performance standard were not met, the balance of the undeveloped property would revert to SFA and then, in turn, to NASA.

Tenant-Selection Criteria. The tenant-selection criteria should reinforce the vision of the project, KSC, and Florida's Space Coast as a world-class research and development center. These selection criteria may limit the ability of the master developer to recruit just any business park end user and, thus, may harm the short-term economics of the project; however, these criteria are extremely important in focusing the development efforts. With foresight, and creative planning, development, and operating management, the ISRP can achieve its rightful place among domestic world-class research and development parks.

The tenant mix also needs to reflect the need for services that contribute to the desirability of the park as a functional location. These services include business services, such as hotel, conference-center, or extended-stay facilities, as well as office services that serve the local community, such as package delivery and copying and printing services.

Finally, the tenant mix should encourage the master developer to invest in the development of buildings that anticipate future users. These "speculative" buildings will be necessary for tenant recruitment because they will allow immediate accommodation of a user. However, because they do involve risk, they will require use of an appropriate level of incentive payments or adjusted rates of return to induce the developer to take that risk.

Security Criteria. Several security requirements will need to be addressed. These are relatively straightforward and simply need to incorporate NASA's need for appropriate development conditions. These issues include:

- Segregation of proprietary from nonproprietary activities;
- Fire protection; and
- Use of hazardous materials and the need to screen tenants that may be inappropriate.

Fair Market Value. A residual land–value analysis of economic viability demonstrates that the current value of the property is actually negative. However, such an analysis is based on existing, not future, market conditions. The panel suggests that a way to reflect the possible future value of land is through a mechanism in which consideration, or payment, for land is established as a per-

centage of future ground lease revenues. Typically, raw land values will end up at 5 to 10 percent of finished land values (i.e., building pads ready for construction).

Earmarking of Participation Revenues. Any participation revenues should remain in capital accounts dedicated to the project, in a manner similar to the capital accounts for the Visitors Complex. This "control, not custody" arrangement permits the project to develop a capital fund that eventually should make the project self-sustaining.

Payment for Municipal Services. It is expected that the project will receive municipal services, police and fire protection, and utilities from KSC and/or from neighboring municipalities. The development should be required to pay for these services either by contracting directly with a service provider, or, if NASA succeeds in obtaining legislation allowing full cost recovery for services, by contracting with NASA.

Financing Liens on Leasehold Improvements. Finally, there needs to be a provision in the conveyance document stipulating that private leasehold improvements will be financed by private sector institutions and installed on federal property. This is not an unusual situation; a good model for allowing financing liens to exist on private leasehold improvements on federal land is in the privatized military family housing programs.

Select a Master Developer

Upon execution of the MOU, SFA should immediately start the recruitment process for a private sector master developer. This process needs to incorporate the anticipated conveyance conditions, but allow the candidate developers to suggest ink,novative approaches to respond to or to modify the conditions.

The process should include all interested parties, including local and regional developers. There should be an aggressive outreach to seek candidates from among developers with national and international capabilities.

The process should be neither a conventional request for proposals nor a request for qualifications. Instead, the request document needs to be tailored by a qualified real estate development consultant to require developers to address research park experience and qualifications, approach to marketing and user recruitment, international research park experience, financing and bonding capacity, response to the performance payment system, and response to the draft tenant-selection criteria.

The selection process needs to take place at the SFA board level, but there should be a formally established advisory board that includes NASA and other local stakeholders.

The recruitment of a master developer should anticipate a system of performance payments to address project economics and developer incentives. These payments should include the following components:

- Upon satisfactory submittal of the detailed development plan (described below), the developer should receive a payment of $200,000 to $300,000 to reflect the cost of preparation.
- Upon installation of phased infrastructure, the developer should receive a payment to fully reimburse costs, estimated to be up to $2 per square foot of land. This payment envisions that the master developer is responsible for financing and installing the infrastructure. Such a mechanism maximizes the speed of infrastructure installation and minimizes the potential that public sector contracting provisions will drive up costs and slow down installation.
- Graduated performance payments should be made upon approval of executed ground leases with users. The developer should receive higher payments for leasing to more-attractive users than to less-attractive users. The master developer should give SFA and NASA participation in lease revenues as deferred consideration for land.
- The master developer should have the right to develop "build-to-suit" as well as speculative buildings.

There should be a "fast-track" tenant-approval process. When a proposed lease is submitted for approval to SFA, action should be required within

NASA

The 15,000-foot Shuttle Landing Facility at the Kennedy Space Center is one of the largest runways in the world.

30 days. Lack of a response should be deemed approval.

Within 90 days of selection of the master developer and execution of the sublease of the property to the developer, the developer should submit a development master plan to SFA for the property addressing the following issues:

- Design guidelines and a design-review process;
- Layout and circulation;
- An environmental assessment;
- A conceptual phasing program;
- A marketing approach, including draft, internationally scoped marketing materials;
- Proposed covenants, conditions, and restrictions (CC&Rs) for recording against leasehold interests;
- A funding program involving charges to a user association for municipal services that provides for payments to NASA;
- Proposed security arrangements; and
- Provisions to establish a free trade zone.

Execute a Disposition Agreement

SFA should execute, with NASA's approval, a sublease of the site to the master developer that incorporates the final business terms agreed to as a result of the developer-selection process and conveyance of the property from NASA to SFA.

Local Stakeholder Collaboration

The proposed ISRP project affects stakeholders throughout the region. These stakeholders include:

- Brevard, Orange, and Seminole counties;
- Titusville;
- Adjacent homeowners;
- Florida colleges and universities;
- NASA;
- The U.S. Air Force;
- SFA and the Florida Commercial Space Financing Corporation;
- Labor unions;
- Economic development corporations; and
- Other developers and landowners.

Coordination and cooperation among local stakeholders will be required to resolve many local and state issues involving the ISRP. Among these are:

- Legislation to earmark sales tax from the Visitors Complex for the project;
- Concurrency analyses;
- Exemption from or abatement of property taxes for the project;
- Joint marketing of the ISRP;
- State and federal support for the project; and
- Impacts of the project on nearby residential areas.

The panel suggests that NASA form an International Space Research Park Advisory Group as soon as possible to review continuously these and other issues concerning the project and to suggest approaches to addressing them. It may be appro-

priate to include among the advisory group's membership such people as:

- NASA representatives;
- State representatives;
- County officials;
- City officials;
- U.S. Air Force officials;
- SFA officials;
- College and university representatives; and
- Other stakeholders.

A Simple, Fast Approval Process

The development approval process must be quick, straightforward, and, at the same time, inclusive and credible. As one way to achieve these goals, NASA in its conveyance document should delegate the maximum amount of authority to SFA. While accountability must be maintained, it is suggested that NASA have "approval rights" on as few issues as possible to maintain a decision-making process that is as streamlined as possible. Once the initial conveyance document is executed, the only issue that should be reserved for NASA is approval of the lease with the master developer.

SFA should be the final decision maker on the following issues:

- Selection of the master developer;
- Approval of the development master plan;
- Approval of tenant selection based on the criteria established by NASA; and
- Approval of performance payments.

In exercising its authority concerning the selection of the developer and approval of the development master plan, SFA may rely on the advice of the ISRP Advisory Group.

Conclusion

To the panel, NASA represents the modern epitome of the risk/reward equation: daring to dream and undertake the challenge of moving humans and materials from the bounds of Earth to space, returning them to Earth, creating knowledge and value from that effort, then reaching even higher the next time. The space program's incomparable impact on the drive to stretch the limits of mankind's intellect and improve the quality of life on earth could not have been achieved without the decision to take a risk while, at the same time, assessing and implementing appropriate measures to mitigate that risk and learn from mistakes.

The panel urges NASA and the Kennedy Space Center to draw upon this heritage to take an institutional risk and create a world-class research park that can facilitate its missions of leadership in space-launch operations and preeminence in spaceport and range technologies. The panel concurs with NASA and its public and private partners that achievement of these objectives can result in the growth of intellectual capital, the continued leveraging of technologies for everyday applications, the creation of jobs and economic growth in Florida, and, ultimately, the creation of a transportation and research mode with academic richness and commercial viability and reliability.

These goals coincide with those expressed by Florida for its space industry. Multiple state, county, and local jurisdictions and economic development arms are already working to achieve the same objectives in Florida by leveraging the presence of NASA and KSC. Partnerships with the Cape Canaveral Air Force Station and a growing array of commercial launch contractors also present NASA and KSC with the opportunity to leverage resources, often shrinking in absolute terms, to further mitigate risk and to enhance operational efficiency, technology, and job creation.

Real estate development is another form of the risk/reward equation. While it may not be "rocket science," successful development requires the careful process of assessing current conditions, projecting desired results against unknown and uncontrollable consequences, taking steps to mitigate the unknown and the uncontrollable, and executing a plan to maximize the rewards. Like any process, it is an art form, with its own set of unique interdependencies and dynamics.

The panel believes that creation of the Space Experiment Research and Processing Laboratory is an important first step that illustrates the possibilities when there is a shared vision, institutional partnering and risk-taking, a lowering of institutional barriers, and an extension of long-standing NASA and KSC public/private partnering. These actions, combined with the potential of emerging technologies and the eagerness of academic institutions and private enterprise to expand those technologies commercially, provide the foundation for the next step in the process—the development of the International Space Research Park at the Kennedy Space Center.

NASA

Speaking to Congress and the nation at a joint session of Congress on May 25, 1961, President John F. Kennedy said, "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to Earth."

About the Panel

Alex Rose

Panel Chair
El Segundo, California

Rose is director of development for Continental Development Corporation, an El Segundo, California–based developer of suburban office/research and development parks with holdings that include 3 million square feet of space in San Francisco and southern California's South Bay market. He oversees planning and execution of all tenant-improvement, core, and shell renovation and new construction; major facilities maintenance and upgrades; project budgeting and cost controls; internal project management; architect, engineer, and contractor management; acquisitions; and new project development.

Rose is chair of the ULI Commercial and Retail Development Council, vice chair for concurrent programs for the ULI Program Committee, and vice chair for outreach for ULI Los Angeles. He also has served on several ULI Advisory Services panels, focusing on downtown and transit-corridor redevelopment and revitalization. He is on the steering committee of New Schools/Better Neighborhoods, an advisory board that is researching and developing standards and methodologies for development of more than 100 new community-asset public schools in the Los Angeles metropolitan area.

Rose received an MBA degree from the University of Southern California in 1990, a law degree from the Southwestern University School of Law in 1980, and a bachelor of arts degree in political science from UCLA in 1977.

Daniel Conway

Aurora, Colorado

Conway is a real estate marketing and research expert specializing in residential, commercial/industrial, and golf course developments, and has more than 30 years of experience as an urban land economist. As president and director of economics and market research for THK Associates for the past 20 years, he has conducted residential, commercial, industrial, and golf course economic feasibility and market studies, socioeconomic impact assessments, and financial planning studies.

His projects include an international market center and industrial market analysis for the Dove Valley Business Air Park in Arapahoe County, Colorado; a residential and related uses market analysis for several major developments in Douglas County, Colorado, including a 1,342-acre Parker City site; and numerous golf course feasibility studies throughout the country. Specific communities where Conway has completed research and analysis include Las Vegas and Reno, Nevada; Oxnard, Palm Springs, and Carmel, California; Kansas City, Missouri; Oklahoma City and Tulsa, Oklahoma; Austin, Texas; Albuquerque and Santa Fe, New Mexico; Seattle, Washington; and Phoenix and Tucson, Arizona.

Most recently, Conway has made numerous presentations on golf course development at the Crittenden Golf Development Expos and has written a book, *The Cost and Revenues of a Unique Golf Club*. Under his guidance, THK Associates each year completes more than 75 golf course feasibility studies and golf driving range market studies and appraisals.

Charles Long

Reno, Nevada

Long is a principal of Economic Development Municipal Solutions, a consulting practice that assists local governments with economic development and public/private partnerships. He has 25 years of diverse experience in local government, including eight years as city manager of Fairfield,

California, a community with a national reputation for being innovative and well managed.

Before his tenure as city manager, he also served as redevelopment director, finance director, and assistant city manager. Long also spent four years as a municipal finance consultant before joining Fairfield and conducted research on capital financing and land use planning.

Long's expertise includes economic development, finance, cooperative land use planning, organizational development, and civic partnerships. He has experience in local government innovation, with expertise in getting parties with diverse interests to work together to maximize their common goals.

Laurin McCracken

Memphis, Tennessee

McCracken is the marketing and strategies officer for Looney Ricks Kiss Architects and Planners, based in Memphis, with offices in Nashville, Tennessee; Houston, Texas; Princeton, New Jersey; and Celebration, Florida.

He formerly was director of national accounts and marketing for McClier, a design/build company specializing in technical projects, and also was chief executive officer of the Global Design Alliance, a grouping of architectural, engineering, and specialty consulting firms with a collective staff of more than 2,800 professionals. Earlier, he was with HNTB Corporation, where he was the director of marketing for its architectural services, and he was director of marketing for RTKL Associates for ten years, leading its national and international marketing efforts.

McCracken is a registered architect in Texas, Illinois, and New Jersey, holds certification from the National Council of Architectural Registration Boards (NCARB), and is a registered interior designer in Texas. He is a member the American Institute of Architects and NACORE International, where he is a past member of the national board and currently holds the designation of master of corporate real estate. McCracken also is chair of the ULI International Council and a 20-year member of the International Development Research Council (IDRC).

He holds bachelor of arts and bachelor of architecture degrees from Rice University and a masters degree in architecture and urban planning from Princeton University.

Ehud Mouchly

Oakland, California

Mouchly has been chief executive since 1999 of READI, LLC (Real Estate Assets Development & Investments), a private real estate finance and development company based in the San Francisco Bay area. READI also is a codeveloper and principal of a planned 200-acre suburban commercial mixed-use project in San Joaquin County, California.

Mouchly has 30 years of experience in the financing, development, and operations management of real estate projects and portfolios, with specific national and international expertise in large-scale mixed-use developments, master-planned communities, public/private joint ventures, and applications of technology in real estate. Before forming READI, he was managing director in the real estate group of PricewaterhouseCoopers. Earlier, he was a founder and for 18 years was a principal of KMG (Kotin Mouchly Group) and its predecessors, SKMG and KRM. During the 1970s, he was a developer and served in senior management positions with the Larwin Group and Leisure Technology, national developers of housing and retirement communities.

He is the immediate past chairman of the ULI Community Development Council (Silver Flight) and a member of the ULI Program Committee. He is an adjunct associate professor in the master of real estate development program at the University of Southern California, and a member of numerous other organizations, including the Counselors of Real Estate (CRE), the International Real Estate Federation (FIABCI), the Pacific Rim Council on Urban Development (PRCUD), and Lambda Alpha International.

Dennis Pieprz

Watertown, Massachusetts

Pieprz is a principal at Sasaki Associates Inc., where he plays a leading role in many of the firm's urban design and planning projects. His experience includes design for urban districts, new communities, urban regeneration, campus planning, and waterfront developments. His design work has received numerous awards, including two Progressive Architecture Urban Design citations, and an Honor Award and two Merit awards from the American Society of Landscape Architects. He has served on numerous design juries and has taught an urban design studio at Harvard University.

Pieprz received a bachelor of architecture degree with honors from the University of Toronto in 1983 and received a master of architecture in urban design (with distinction and thesis prize) from Harvard University in 1985.

John Prosser

Denver, Colorado

Prosser is a professor of architecture and urban design at the University of Colorado, where he has served as dean of the university's College of Architecture and Planning, and has taught at other universities, including Oxford Polytechnic in England. Beginning private practice in 1969, he has served as a planning and architectural consultant for projects such as the Denver Technological Center, Denver International Airport environs (private sector), and the Denver Botanic Gardens. He also has planned major retail facilities in Kansas, Colorado, California, Hawaii, and Arizona.

Since 1981, he has chaired the systemwide University of Colorado Design Review Board, which critiques all projects on nine campuses. He also is a member of eight federal, state, municipal, and private architectural review committees and was a nucleus founder of the Real Estate Center at the University of Colorado. Prosser also served on the decommissioned Lowry Air Force Base Economic Recovery Committee for Denver and Aurora, Colorado, to provide expertise for reuse planning and implementation. He has received numerous national, regional, and state awards.

Prosser received his BS degree in architecture from the University of Kansas and his master of architecture degree from Carnegie Mellon University in Pittsburgh.

Barry Scribner

McLean, Virginia

Scribner is a senior vice president at Jones Lang LaSalle's Washington, D.C.–area corporate office in the firm's global consulting specialty, where he is project manager of a diverse portfolio for clients that includes the U.S. Army, the U.S. Air Force, and the General Services Administration. As project manager for the Army's multibillion-dollar housing privatization initiative, which involves 12,000 housing units at three pilot installations, he leads an integrated team of Jones Lang LaSalle and PricewaterhouseCoopers professionals. The team provides the Army with real estate, financial, and advisory assistance services to support the acquisition, evaluation, negotiation, and management phases of the projects.

Before joining Jones Lang LaSalle, Scribner worked for Tenneco, Inc., managing development of the company's corporate campus in Greenwich, Connecticut, and directing all support activities for the corporate offices and grounds. Before that, Scribner was a tenured professor of economics and director of the Office of Economic Analysis for the U.S. Military Academy at West Point, New York. He also advised the U.S. Army on housing issues and on installation management and operations functions worldwide.

He is a member of the American Economic Association, the National Association of Installation Developers, the Professional Housing Management Association, and the Real Estate Economics Association, and he is an associate member of ULI. Scribner received a bachelor of science degree in engineering from the U.S. Military Academy at West Point, and a master of public policy degree and a PhD from Harvard University.

Steven W. Spillman

Mission Viejo, California

Spillman is a principal of Pacifica Companies, a real estate development and management firm specializing in income-producing projects and corporate properties throughout the United States and the world.

During the past 25 years, Spillman has been responsible for creating business plans and managing multistate operations; structuring and managing financial, ownership, and other contracts; securing regulatory approvals in complex political settings; and developing, leasing, acquiring, selling, and managing a variety of projects. His work has involved mixed-use, office, retail, industrial, recreational, and market-rate and low-income multifamily properties. His specialty is turning around troubled projects to increase cash flow while mitigating risks of both new construction and adaptive use.

Before joining Pacifica in 1991, Spillman was principal at Mitsui/Birtcher, where he directed a $400 million mixed-use development, a $224 million joint venture with Xerox, and other projects in California and Arizona. He also has worked at Burnham Properties and Jaymont Properties, was development manager for Aetna's Urban Investment and Development Co., and was a senior vice president of Trammell Crow. Before entering real estate, he was an architect, planner, and construction manager.

Spillman was an Everham Scholar at Purdue University. He graduated with honors from Kansas State University with a bachelor of architecture degree, and he has an MBA in finance from the University of Missouri. He is a licensed real estate broker and registered architect.